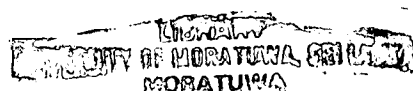


**ANALYSIS OF ELECTRICAL ENERGY  
CONSERVATION APPROACHES AND  
MANAGEMENT FOCUS TOWARDS ENERGY  
CONSERVATION IN THE GARMENT INDUSTRY  
IN SRI LANKA**

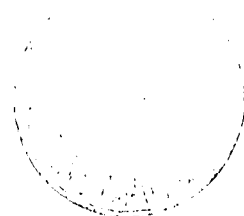


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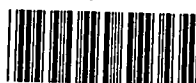
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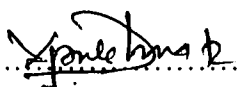
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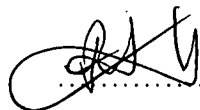
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## List of Abbreviations

|       |   |   |
|-------|---|---|
| NIE   | - | Newly Industrialized Enterprises                              |
| MFA   | - | Multi Fibre Agreement   |
| ATC   | - | Agreement on Textiles and Clothing                            |
| USA   | - | United States of America                                      |
| EU    | - | European Union  |
| JAAF  | - | Joint Apparel Association Forum                               |
| AGOA  | - | African Growth and Opportunities Act (NAFTA)                  |
| CBI   | - | Caribbean Basin Initiative                                    |
| NAFTA | - | North American Free Trade Agreement                           |
| ADB   | - | Asian Development Bank  |
| CEB   | - | Ceylon Electricity Board                                      |
| ESCO  | - | Energy Service Company  |
| ESP   | - | Energy Service Provider                                       |
| M&V   | - | Measurement and Verification                                  |
| IPMVP | - | International Performance Measurement & Verification Protocol |
| ECM   | - | Energy Conservation Measure                                   |
| EECT  | - | Electrical Energy Conservation Techniques                     |
| SAH   | - | Standard Achieved Hours                                       |
| SMV   | - | Standard Minute Value   |
| US    | - | United States   |
| EECA  | - | Electrical Energy conservation Approaches                     |



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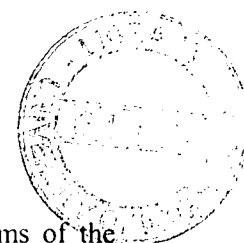
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## Abstract

The apparel industry plays a significant role in the Sri Lankan economy in terms of the contribution to the industrial production, foreign exchange earnings and employment generation. It has experienced a phenomenal growth during the past twenty five years and has emerged as a major sector in the Sri Lankan economy. The Multi Fiber Agreement, which had been established in 1974, allowed the developed countries to have bi-lateral trade agreements with individual garment exporting countries. This provided a positive approach for Sri Lanka with the opportunity to have a steady demand from the export markets in the developed countries.

But with the end of the quota system in 2005, Sri Lankan garment industry has to face the competition from the other competitive countries such as China, Mexico, India and Malaysia etc. In such a market rivalry, the success of the industry will depend on the proper market strategy of either cost leadership or differentiation or a mix of them. The possible workable approach of price leadership essentially needs the garment industry to have a low cost manufacturing. This could be achieved by more efficient utilization of raw materials, utilities, and labour and by finding more economical sources of raw material procurement. The impact of the cost of the energy for the production directly reflects in the cost of the product and this influences the price competitiveness of the Sri Lankan garment industry in the global market. In such an environment, the industry should focus on energy conservation techniques in order to reduce the increasing manufacturing cost.

The scope of this research is to find out how the level of management focus towards the energy conservation has affected the level of implemented electrical energy conservation techniques in the Sri Lankan garment industry. Two objectives had been derived where the primary objective is to study and establish a relationship between the level of the Electrical Energy Conservation Approaches and the level of the Management Focus towards the energy conservation and the secondary objective is to perform a preliminary study to find out a possible relationship between the Cost of Electrical Energy for unit production output and level of Electrical Energy Conservation Approaches.

The samples had been selected from the major players in the industry and the data had been gathered primarily through a questionnaire survey. However interviews were also conducted to gather a clear set of information. The data was analyzed following the descriptive analysis methodology and the writer attempted to explore all possible relationships of hidden components.



The study revealed that the trend between the Electrical Energy Conservation Techniques and the level of Management Focus towards the energy conservation has a positive relationship. The higher the Management Focus the higher the implementation of Electrical Energy Conservation Techniques and vice versa. Therefore it is essential to improve the level of the management focus towards the energy conservation of the organization in order to increase the level of electrical energy conservation and consequently reduce the cost of production to be price competitive in the market.

In addition, it had been found that the variation of the Management focus towards the conservation approaches across the samples is very high because some organizations have almost nil management focus whereas some organizations are at a highly satisfactory level. This high variation predicts that the effort needed to bring the electrical energy conservation level up is very high. However the average level of the management focus towards the energy conservation and the highest level follow a similar behaviour. Consequently that says the organizations are moving towards the right direction as an average.

In further analysis, it has been found that the energy conservation strategy plays a major role and the senior management commitment with an explicit policy on energy conservation and an action plan for execution are essentially required for a better performance in Electrical Energy Conservation. Furthermore, the top management commitment is a must for the implementations, but that commitment should be reflected in the organization policy or business strategy.

In addition, it was found that the hiring of an employee with the knowledge in Engineering alone will not result in good level of implementation of conservation techniques, but needs to establish and improve the strategy, structure, systems etc. Also the project evaluation methods for appraisal of energy conservation opportunities mostly been used is the short term pay back or low cost criteria where as the long term effects are not highly appreciated. Also a proper monitoring verification system is not followed in the sample organizations, which needs to be introduced and emphasized strongly.

With proper monitoring and verification (M&V) system, the organizations can receive benefits by increased certainty, reliability, and level of savings. For garment factories in Sri Lanka, the M&V approaches of Partially Measured Retrofit Isolation and Retrofit Isolation can be used. Once this sort of M&V option is agreed upon, the output of the implemented energy conservation measure will be closely monitored. If the organizations make a performance contract with energy service companies (ESCO), they can invest on energy



conservation projects considering the same payback criteria as for all other investments. This performance contract can be either guaranteed or shared savings.

The study revealed that for the development of the Electrical Energy Conservation Approaches in the garment industry, proper level of Management Focus towards the energy conservation is essentially required.



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